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MEDICAL NEWS LETTER

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

Change of Address

Please forward changes of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda, Maryland 20014, giving full name, rank, corps, and old and new addresses.

The issuance of this publication approved by the Secretary of the Navy on 28 June 1961.

Goodpasture's Syndrome

CDR Paul D. Doolan* MC USN—Proceedings of the Monthly Staff Conferences of the U. S. Naval Hospital, NNMC, Bethesda, Md., 1962-1963.

The material which follows represents but one of many examples of collaborative work between the Clinical Investigation Center and other departments of the U. S. Naval Hospital, Oakland. In this particular instance, LT Fred L. Benoit, of the Department of Internal Medicine, CAPT David B. Rulon, of the Pathology Department, and CDR Raymond H. Watten and Dr. George B. Theil of the Clinical Investigation Center, were the collaborators. It is this type of close working relationship that is fostered at the Medical Center.

The material consists of 9 patients the doctors have examined and studied, and a review of the reported literature. Two typical cases are presented.

Case No. 1. This twenty-one year old woman was first admitted on April 9, 1961, by transfer from another Service hospital because of approaching uremia. She was entirely well until March 17, 1961, when she had experienced nausea and vomiting, followed by headache and mild neck stiffness. On March 23, bilateral costovertebral angle pain, dark brown urine, and fever to 102°F. developed. Hematuria was found on urine examination, and administration of a sulfonamide drug was begun. She was hospitalized initially on March 29 for presumed pyelonephritis. The physical examination was within normal limits, with blood pressure 128/78 mm of Hg. Laboratory evaluation showed hematuria, non-protein nitrogen of 13. 5 mg per cent, and hematocrit, 30 per cent.

Her condition was stable until April 6, 1961 when it was noted that the hematocrit had fallen to 12 per cent without evidence of blood loss. Chest roentgenogram showed a diffuse, bilateral, soft pulmonary infiltrate. The total bilirubin did not rise, hypotonic fragility tests were normal, and bleeding, clotting studies and the prothrombin time were normal. She was treated with two units of whole blood and 500 ml of packed red blood cells, with a hematocrit elevation to 30 per cent. The following day the urine output was 200 ml and the blood urea nitrogen had risen to 72 mg per cent. Following the appearance of the pulmonary infiltrate, administration of penicillin, streptomycin, isoniazide and hydrocortisone was begun. Because of this approaching uremia and oliguria, she was transferred for artificial dialysis therapy.

The past history revealed that the patient had had six episodes of genitourinary infection, and in August 1960 she had left pleuritic pain, fever and a friction rub, but no diagnosis was established.

Physical examination revealed a thin, pale, apprehensive white woman with a poorly functioning tracheostomy. Her pulse was 120 per minute and

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* Director of the Department of Clinical Investigation, Naval Medical Research Institute, National Naval Medical Center, Bethesda, Md., Dr. Doolan has been selected for promotion to the rank of Captain MC USN.

regular, and the blood pressure was 140/80 mm of Hg. The respiratory rate was 30 per minute and examination of the lungs revealed bilateral tracheal breath sounds. There was a loud protodiatolic third heart sound and a trace of pretibial edema. The remainder of the examination was within normal limits.

Upon her arrival on the ward, the patient became apprehensive without respiratory assistance from a positive pressure respirator. An electrocardiogram revealed ST-T wave alterations consistent with hyperkalemia; shortly following this procedure she became cyanotic and dark red blood issued from the tracheostomy. Continuous aspiration of the trachea yielded 600 ml of blood, and despite supportive measures, the patient died.

The manner of death was massive pulmonary hemorrhage, and the duration of her illness was 23 days. Dr. E. H. Lennette, Viral and Rickettsial Disease Laboratory, California State Department of Public Health attempted to isolate a virus from lung, kidney, and other tissues obtained at necropsy, but was unsuccessful.

Case No. 2. This nineteen-year old man was admitted to the U. S. Naval Hospital, Oakland, on April 10, 1962 because of anemia. He was entirely well until six weeks previously, when he had fever, chills, and malaise. With this episode he began to cough up blood-stained sputum. The hemoptysis abated, but he continued to experience fatigue and malaise, therefore, he was examined at the Naval Dispensary. Evaluation revealed anemia and right lower lung infiltrate on roentgenographic examination, and he was referred to Bethesda. His only symptom on entrance was dyspnea upon exertion.

The physical examination was normal except for pallor. The pulse was 90 per minute, and blood pressure, 150/60 mm of Hg. The leukocyte count was 4, 300 with a normal differential count. The hemoglobin was 8. 8 per cent and the hematocrit 28 per cent. The reticulocyte count was 2. 2 per cent, and the sedimentation rate was normal. The bilirubin concentration, direct and indirect Coombs' test, hemolysin test and cold agglutinin determination were all normal. The serum iron was 21. 3 mg per cent (normal range is 56-183), and total iron-binding capacity, 431 mg per cent (normal range is 248-422). The initial urinalysis was normal at a specific gravity of 1. 023. Examination of the sputum was negative for pathogenic organisms or fungi, but many hemosiderin containing macrophages were present. The roentgenogram showed nonspecific infiltrate in the middle third of the right lower lung field.

The patient's hospital course was one primarily of evaluation. The total protein was 7. 1 gm per cent and protein electrophoresis revealed the following distribution: albumin 3. 9 gm per cent; alpha$_1$ globulin 1 gm per cent and 0. 9 gm per cent gamma globulin. A measure of the heterophile titer, antistreptolysin O titer, blood group and febrile agglutinins indicated that he was producing antibodies. The blood urea nitrogen, creatinine, serum cholesterol, serum glutamic oxalacetic transaminase (SGOT) test, and thymol turbidity were normal. Frequent examinations of the stools for occult blood were negative and an upper gastrointestinal roentgenographic series were normal. The bone marrow examination was compatible with iron deficiency.

Two weeks following admission the patient had protein, many red cells, and granular and hyaline casts in the urine. The creatinine clearance was 140 ml/min and the blood urea nitrogen was unchanged. An intravenous pyelogram was normal.

The patient's condition generally improved with clearing of the infiltrate by roentgenogram. However, one month after admission, his hemoglobin suddenly fell to 4 gm per cent, associated with marked dyspnea. The chest roentgenogram showed bilateral infiltration in the lower lung fields. He was given blood transfusions with symptomatic improvement and stabilization. No hemoptysis appeared during this episode.

Ferrokinetic studies were performed at the Donner Laboratory, Berkeley, with serial counts of radioactivity over a two-month period following injection of Fe^{59}. These studies demonstrated the pulmonary sequestration of 1875 ml of blood during the 57 day study and accelerated erythropoiesis, iron deficiency and slight splenic red blood cell sequestration. During the time of this study the patient was not manifesting hemoptysis.

Percutaneous renal biopsies were performed on May 14 and July 13, 1962. The patient started on oral iron therapy with a good response to 15.3 gm per cent, and was discharged from the hospital on August 31, 1962.

One week following discharge, the patient had a viral-like illness and slight fever, malaise, myalgia and sore throat. He was treated symptomatically, but again manifested hemoptysis and dyspnea. He was, therefore, readmitted on September 10, 1962.

Examination revealed a pale, chronically ill-appearing man in moderate respiratory distress, who was coughing up blood. The blood pressure was 140/60 and pulse 60 per minute. There were inspiratory rales over the right anterior chest with dullness to percussion. The remainder of the physical examination was unremarkable.

The hemoglobin was 11.6 gm per cent and chest roentgenogram again showed bilateral basilar infiltrates with patchy densities throughout both lung fields. The urine showed 100 gm per cent of protein, and many red cells and granular casts at a specific gravity of 1.010. The blood urea nitrogen was 35 mg per cent and creatinine 1.8 mg per cent.

He was treated with oxygen and bed rest, but the hemoglobin level continued to fall until it was 7.4 gm five days later. He was given further blood transfusions and iron intramuscularly, but continued to have severe dyspnea and hemoptysis. The plasma creatinine rose to 5.7 mg per cent. Prednisone, 60 mg daily, was begun with no change and repeated transfusions were required. The patient died on September 24, 1962, with severe hemorrhage and pulmonary insufficiency. The duration of his illness was 7 months.

Review of these 2 cases and the other 7 studied, and those reported in the literature, provides a perspective from which the author can offer the following observations.

A total of 54 patients are available. Forty-nine of them comprise a reasonably homogeneous group in which a rather typical clinical picture emerged.

The presenting complaints were hemoptysis, or dyspnea, or less frequently, flank pain. Within days to months the patient complained of increasing dyspnea. Renal signs usually, but not always, appeared later, and consisted of hematuria or unexplained oliguria. Within a year the respective patient expired either from pulmonary or from renal insufficiency. A hypochromic iron deficiency anemia has been almost constantly an associated finding, but hypertension, or a bleeding defect, have not been features of the presenting illness. Thirty-three of these 49 patients have been 25 years of age or less, but 4 of the patients have been 56 years old, or older. Only 2 of the patients have lived more than 12 months, and more than 50 per cent died within 6 months of the initial signs or symptoms.

The sex ratio is 6:1 in favor of males. The rapidity of the course of illness is independent of the age of the patient. If the patient expires within a month, the modus exitus is usually pulmonary, but deaths in uremia, and combined uremia and pulmonary hemorrhage make up a large percentage of those dying within 8 weeks. Similarly, pulmonary insufficiency may still be the cause of death in those patients who survive 6 to 12 months.

The significant findings at necropsy are usually confined to the lungs and kidney. In the lung, the dominant findings are pulmonary hemorrhage, hemosiderosis and the sequels thereof. Some patients have had an associated alveolitis. When findings from the serial renal biopsies performed are pieced together with those done by other investigators, and the autopsy reports, the evolution of the renal lesion might be described as follows:

First, there is a localized deposition of a fibrinoid material in a single capillary loop in the glomerulus. This is associated with large cells with a basophilic cytoplasm and with the passage of time, epithelial proliferation. The proliferative changes at first remain localized and the lesion is focal in distribution both in terms of the individual glomerulus and the population at large. At some variable point in time the lesions become more generalized and proliferative changes involve the entire glomerulus, accompanied by infiltration of polymorphonuclear or round cells, synechiae, pseudo-glandular transformations and definite fibrosis. In its final form the glomerulus may resemble a fibro-hyaline knot.

In roughly 20 per cent of the patients, vascular lesions are demonstrable, but they are infrequent in number, and are seen only after a definite search has been made. Some of the lesions are typical of polyarteritis, others fall short in fulfilling the requirements for the accepted criteria.

The five remaining cases have individuating features warranting special consideration. Two of the patients exhibited clinical courses consistent with both Goodpasture's syndrome and polyarteritis. These, together with other cases in which vascular lesions have been found prohibit rigid separation of this syndrome from polyarteritis. Similarly, three of the patients clearly had idiopathic pulmonary hemosiderosis with renal lesions. Two of the latter group are still alive. These cases in turn point up the overlap between Goodpasture's syndrome and idiopathic pulmonary hemosiderosis.

The etiology of this syndrome remains unknown. It was described by Goodpasture in the case of two hospital corpsmen at the U. S. Naval Hospital, Chelsea, who were victims of the 1918 influenza epidemic. In a number of the cases subsequently reported, mention has been made of the non-specific symptoms often seen in viral illnesses. These symptoms were sometimes present when the patient just began to cough or to show dyspnea. In point of fact, however, there is no hard evidence in support of a virus as the etiologic agent. Speculation has also included a hypersensitivity mechanism evoked in response to some as yet unknown antigen. In support of this line of reasoning the following observations may be cited.

1. The similarity of the renal lesions with those of the glomerulonephritis seen in Henoch-Schoenlein purpura, the microscopic from of polyarteritis and the fulminant form of Ellis Type I nephritis.
2. The presence of vascular lesions in a certain percentage of the cases, some of them being typical of polyarteritis.
3. The production of intra-alveolar hemorrhage in sensitized rabbits given albumin and the observance of these lesions in certain patients who were dying of sulfonamide reactions.

Again, these observations are interesting and may be most valuable, but as yet, no direct proof has been offered in support of the foregoing hypothesis.

Treatment remains supportive, and totally inadequate. At least 21 of the reported patients had received steroids, but with dubious results. Before these agents are finally evaluated, there must be studied a group of patients who have received high doses from the earliest possible date and certainly before the renal failure becomes well-advanced. Although there is a theoretical basis for a therapeutic trial with one or more of the antimetabolites, such a step at this point in the understanding of the syndrome would be tempting prudence, particularly in the cases of those patients with active bleeding into their lungs.

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Prevention of Drug-Resistant Bacteria Achieved by Navy-Sponsored Study

From: Technical Information Office, Office of Naval Research, Washington, D. C.

The discovery that atabrine combined with a specific antibiotic in laboratory tests has prevented the development of bacteria resistant to these drugs. This was announced by Dr. M. G. Sevag recently at the American Society for Microbiology meeting in Washington, D. C.. Dr. Sevag's work has been conducted at the University of Pennsylvania School of Medicine under a contract with the Office of Naval Research.

The significance in the use of atabrine, which has been widely used in humans as an antimalarial agent, is that it not only prevents another drug from causing mutation but is also clinically safe.

This potential new use of atabrine grew out of previous research by Dr. Sevag on how to prevent bacteria from developing new strains resistant to drugs used against them. This has been one of the chief barriers to the successful use of modern antibiotics. The problem has been that when antibiotics are used against such disease-causing bacteria as hospital staph (Staphylococcus aureus), bacterial mutants develop against the antibiotic which is no longer effective.

Previous investigation at the University utilized the substances, spermine and spermidine, members of the family of chemical compounds called polyamines. When these substances were combined with streptomycin or penicillin, they succeeded in preventing the emergence of resistant cells in certain

bacteria. The question remained, however, whether these substances could be safely introduced into biological systems.

Atabrine (quinacrine) was selected for study as a possible substitute for the polyamines since it has been well documented for use in humans. Atabrine by itself has minimum effect on the bacteria studied in the laboratory tests. When the substance was combined with an antibiotic, such as streptomycin, penicillin, novobiocin, erthromycin, tetracycline or sulfathiazole, it prevented the emergence of drug-resistant bacterial strains.

"Atabrine hydrochloride, possessing the capacity to combine with nucleic acids, appears to prevent or control the resistance-inducing functions of antibiotics," Dr. Sevag reported. "Since it also is a safe substance, it possesses the necessary qualities for medical application. This may lead to a new principle of chemotherapy."

The Navy is supporting this work as part of a broad program of research seeking more efficient therapeutic use of drugs and control of disease. The continuing study is expected to throw light on the basic biochemical mechanism of the joint action of antibiotics with atabrine.

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Venereal Disease: A Wrong Prognosis

I would like to touch upon a subject about which we doctors made a wrong prognosis ten years after the ending of the Second World War. We thought at that time that we were no longer concerned with one special problem of public health, [i.e.,] venereal disease. It is abundantly clear that . . . there has been a continued rising incidence of early syphilis and gonorrhoea during the years from 1957 until now . . .

Various causes for this may be enumerated, among which we might consider the increasing promiscuity in the population, particularly among adolescents. It may well be that, in some parts of the world, the stabilizing influence of family life and religion has diminished . . . This means that the rising incidence of venereal disease among teenagers is not only a public health problem in the strict sense of the word: there are psychological and sociological aspects to the promiscuity among young people which warrant careful study. Another cause is certainly the increase of international traffic, and also the current practice of some countries to attract large groups of foreign labourers.

The problem is: what can the authorities do to intensify national and international action against venereal disease? . . . First of all it will be necessary that health administrations should again recognize venereal disease as a real danger, and take the necessary measures. In many countries, after the rise of venereal disease in the Second World War and the spectacular fall afterwards, budgets for the control of venereal disease were decreased considerably. These governments have now to realize that larger sums will again be necessary.

Secondly, more specialized personnel will have to be made available for the organization in charge of venereal disease control . . .

Thirdly, the collaboration of private physicians, general practitioners and specialists must be stimulated to its maximum extent . . .

Fourthly, in order to achieve the full collaboration of the doctors, additional training in the epidemiological and social aspects of venereal diseases must be provided at the undergraduate and postgraduate levels, and research should be promoted.

Fifthly, health authorities should reconsider relevant legislation, and particularly notification systems.

Sixthly, as for all infectious diseases, international co-operation must be intensified: rapid epidemiological action and exchange of information between countries are necessary.

Professor P. Muntendam (Netherlands)
speaking at the Seventeenth World Health Assembly.

—WHO Chronicle 18(4): 133, April 1964.

SOME CONDITIONS HAVING IMPORTANT BLOOD FINDINGS

From Training Manual, "Hematology" (Revised 1962)—by Staff Members of the U. S. Naval Medical School, NNMC, Bethesda, Md.

Acute Hemolytic Anemia

This condition is characterized by rapid destruction of blood accompanied by chills, fever, weakness, nausea, vomiting, and pain in the back, abdomen and extremities. Pallor and jaundice develop rapidly, and the urine and feces become orange-colored due to urobilinogen. There is no bile in the urine, but hemoglobinuria may occur. The liver and spleen enlarge. Anuria may develop. There are many causes, some of which follow: malaria, blackwater fever, bartonellosis, Welch bacillus, hemolytic streptococcus, phenylhydrazine, thiouracil, plasmoquin, sulfonamides, arseniuretted hydrogen, trinitrotoluene, dinitrobenzol, benzene, favism, snake venom, extensive burns, incompatible blood transfusion, and autohemolysins.

Another group of the acute hemolytic anemias are the paroxysmal hemoglobinurias. These are the paroxysmal cold hemoglobinuria, paroxysmal nocturnal hemoglobinuria (Marchiafava—Micheli syndrome), march hemoglobinuria, and paralytic myohemoglobinuria. Paroxysmal cold hemoglobinuria is a condition characterized by the sudden passage of hemoglobin in the urine following local or general exposure to cold. The phenomenon is due to a peculiar cold agglutinin. Syphilis, congenital or acquired, appears to be the fundamental cause though the Wassermann reaction is not always positive. The Donath-Landsteiner test or modifications confirm the presence of the cold hemolysin. Paroxysmal nocturnal hemoglobinuria is an uncommon disorder of insidious onset and chronic course characterized by signs of hemolytic anemia and marked by attacks of hemoglobinuria which occur chiefly when asleep, whether during the day or at night. Carbon dioxide becomes more concentrated during sleep with a resulting lowering of the hydrogen-ion concentration of the blood. The hemolysis depends on the presence of cells sensitive to hemolysis by a thermolabile component of normal serum which is affected by changes in the hydrogen ion concentration. The confirmatory test is the acidified serum test of Ham. March hemoglobinuria is rare and does not cause anemia. It is observed after prolonged walking or running. The cause is unknown. In paralytic myohemoglobinuria, the disorder is attributed to the sudden release of lactic acid from the excessive amounts of glycogen which have accumulated in the muscles. The lactic acid damages the muscles and allows the myohemoglobin to escape into the blood and urine. It is rare and no anemia is associated with it.

The blood picture in the acute hemolytic anemias is usually that of a profound normocytic, normochromic anemia with a high reticulocyte count. There is usually a leukocytosis, which may be marked, with a left shift of the neutrophils. The fragility test is usually normal, although some cases with

recurring attacks show increased fragility of the red cells and are difficult to differentiate from congenital hemolytic jaundice during a crisis. Differentiation is by the direct Coomb's test which is positive in acquired but not in congenital hemolytic anemia. The thrombocyte count is usually increased. The bleeding time and coagulation time are normal.

Agranulocytosis

This is a disease characterized by the absence or marked decrease in the number of neutrophils in the differential count due to a sensitivity to certain drugs, among them aminopyrine, organic arsenicals, sulfonamides, dinitrophenol, thiouracil, benzene, and gold salts. Those drugs having a benzene ring with an attached amine are considered the most dangerous. The bone marrow may show a decrease to absence of metamyelocytes, band and segmented neutrophils, with an increase in myeloblasts, which is interpreted as a maturation arrest; or if late in the disease the bone marrow may be normal. There is usually a low white count, no anemia, normal thrombocyte count, normal coagulation and bleeding time, and increased sedimentation time. The patient may suffer from fever, weakness, and gangrenous ulceration of the throat.

Aplastic Anemia

This is a severe, usually normocytic, normochromic anemia characterized by marked diminution, or complete absence of reticulocytes, nucleated erythrocytes, and polychromatophilic red cells of the blood and bone marrow. The granular leukocytes and thrombocytes are markedly decreased with delayed clot retraction and prolonged bleeding time. All series of the bone marrow, erythrocytic, granulocytic and thrombocytic, are either markedly decreased in number, or if present, the ability to mobilize is impaired. The cause may be idiopathic or due to poisoning by drugs containing the benzene ring, overdosage of x-ray, or radium, among other causes.

Congenital Hemolytic Anemia

This is a chronic type of hemolytic anemia due to an inherited anomaly of the red cells which tend to microspherocytosis and increased fragility in hypotonic salt solution. There are recurrent attacks of hemolytic jaundice with splenomegaly. Rouleaux formation is bizarre in wet preparations of blood. The fragility test shows beginning hemolysis between 0.5 and 0.8 per cent sodium chloride and may be complete at 0.36 per cent. Reticulocytes are greatly increased.

Erythremia or Idiopathic Polycythemia Vera

Polycythemia vera is characterized by a definite increase in red cells as well as blood volume. Hemoglobin may vary from 17-24 gms/100 ml, erythrocytes

6-10.5 million/cu mm, hematocrit 50-80%, and total blood volume 75-140 ml/kg. Bone marrow examination shows increase in the granulocytic as well as the erythrocytic series, the latter being mostly rubricytes and metarubricytes. Many authors regard this disease as being a counterpart of leukemia, in that it represents a malignant neoplasia of red blood cells. A very definite percentage of these cases terminate as a granulocytic leukemia.

Erythroblastosis Fetalis or Hemolytic Anemia of the Newborn

This is a hemolytic anemia which occurs late in fetal life or shortly after birth and is characterized by a severe macrocytic anemia with pallor and jaundice and sometimes edema. The peripheral blood is flooded with nucleated red cells and reticulocytes which come from hyperplastic centers of erythropoiesis in the bone marrow, liver, and spleen in an attempt to compensate for the excessive red cell destruction. The white count is also increased with a shift to the left. Thrombocytes may be reduced. The direct Coomb's test is positive. The hemolysis in the majority of cases is due to the immunizing of the mother, who is Rh negative, to the red cells of the fetus, who is Rh positive. The agglutinin of the mother's serum then produces a hemolytic action on the fetal red cells. The mother's milk may also contain this agglutinin. About 85% of the population are Rh positive and 15% Rh negative. Since only about one of fifty Rh negative individuals are readily sensitized and then so slowly that the first offspring escapes, and since the fetal Rh positive red cells must break through the placental barrier to sensitize the mother, it is estimated that only about 1 in 200 or 300 pregnancies result in erythroblastotic babies. Treatment is by transfusions of properly matched Rh negative whole blood. Erythroblastosis may also be due to blood group factors other than Rh.

Infectious Mononucleosis

This is a rather common disease, usually characterized by fever, enlarged lymph nodes and spleen, and a sore throat. The leukocyte count varies from 6,000 to 40,000 with 50 to 90% lymphocytes. The lymphocytes are atypical. They vary in characteristics from those of prolymphocytes to those of medium size lymphocytes with bean-shaped nuclei and dark to light blue cytoplasm. Vacuoles are often present in the cytoplasm and sometimes in the nucleus. The red cell count and thrombocyte count are usually normal. The serum agglutinates sheep cells in high dilution in 80-90% of the cases. (Paul-Bunnell test) (Davidsohn test). A disease similar to this is seen in children and called infectious lymphocytosis because of a very high white count reaching 50,000 to 90,000 with absolute increase in lymphocyte count. No atypical lymphocytes are seen and the Davidsohn test is negative.

Leukemias

These are fatal diseases characterized by uncontrolled proliferation of leukopoietic tissue. The cells may be granulocytic, lymphocytic, or monocytic. The disease may be acute, subacute, or chronic. The leukocyte count is usually high, and immature types are present. The acute type, in particular is characterized by the presence in the blood of many "blast" cells. Anemia is present and in the acute phase usually is severe. Thrombocytopenia with tendency to hemorrhage usually occurs. Not all leukemias have a high circulating white count even though the leukopoietic tissue of the bone marrow is hyperplastic. The white count may be low or normal, and the leukemia is then called aleukemic, leukopenic or subleukemic. Atypical blood pictures are common, and an examination of the bone marrow is necessary to establish a diagnosis.

Leukemoid Reactions

These are blood conditions that closely resemble, or are indistinguishable from, those of the various types of leukemia. Leukemic changes in the tissues of the body are absent. These reactions have been found occasionally in various infections, chemical and drug poisonings, severe burns, severe hemorrhages or sudden hemolysis of blood and in malignant metastases to bone. The clinical history, subsequent course, alkaline phosphatase reaction of the granulocytic cells, and bone marrow examination are necessary for differential diagnosis.

Thalassemia (Mediterranean Anemia)

This is an inherited type of anemia seen in Italians, Greeks, Syrians, and Armenians. The red cells are thinner than normal and take the form of target cells or are otherwise distorted due to folding of the thin edges. Those individuals with a homozygous inheritance usually die in childhood from a severe anemia called thalassemia major (Cooley's anemia), while those with a heterozygous inheritance of the red cell anomaly thalassemia minor, usually go through life with a hypochromic microcytic anemia or compensate for the low content of hemoglobin in the thin cells by developing a red count that is higher than normal. Thalassemia major is characterized by the presence of hemoglobin "F" in large amounts. Hgb A-2 is present in thalassemia minor, as seen on starch block by electrophoresis.

Microcytic Hypochromic Anemia

This is a common type of anemia in which the red cells are smaller than normal and poorly filled with hemoglobin causing an exaggeration of the central pallor in a stained smear. The cause is an iron deficiency, due either to poor diet, chronic blood loss, poor absorption or poor utilization of iron.

Myelophthisic Anemia

This is a type of anemia associated with space-occupying lesions of the bone marrow, among which are metastatic carcinoma, multiple myeloma, myelosclerosis, marble bone disease, Hodgkin's disease, and lipoid hystiocytosis. The anemia is variable in degree and may be normocytic or macrocytic. There are many nucleated red cells in the smear and myelocytes, progranulocytes, and occasionally myeloblasts are present. The leukocyte count may be low, normal or high. As in other instances, bone marrow examination is required to establish the diagnosis.

Pernicious Anemia

This is a deficiency disease with a macrocytic type of anemia due to lack of an intrinsic factor formed in the stomach mucosa which is necessary for the absorption of vitamin B-12. Normally this erythrocyte maturation factor is formed in excess and stored in the liver, so that normal liver, injected into pernicious anemia patients supplies the deficiency. The blood is characterized by an increase in size of the red cells, which are usually well filled with hemoglobin. A characteristic type of nucleated erythrocyte may be present. This is the rubriblast, of the "pernicious anemia type." The thrombocyte and leukocyte counts are usually reduced. There may be giant thrombocytes. The neutrophils are characteristically of the hypersegmented type. During relapse, bone marrow smears show many rubriblasts of the pernicious anemia type (megaloblasts). During vitamin B-12 or liver therapy, a reticulocytosis is produced. Characteristic findings in the patient are the following: lack of free hydrochloric acid in the stomach contents, glossitis, and spinal cord changes. Macrocytic anemia is also sometimes seen in sprue, pregnancy, liver disease, carcinoma of the stomach, fish tapeworm infestation, intestinal resection or strictures, and achrestic anemia. The latter disease is a progressive macrocytic anemia, usually without spinal cord symptoms or glossitis, and with free hydrochloric acid in the gastric juice. It does not respond to liver due to inability of the bone marrow to utilize the erythrocyte maturation factor. The other diseases listed are also due to deficiencies, chiefly a lack of folic acid.

The radioactive Cobalt-60 Vitamin B-12 absorption test (Schilling test) is very helpful in establishing a diagnosis of pernicious anemia.

Primary Splenic Neutropenia and Primary Splenic Panhematopenia

These names have been applied to diseases in which the normal physiologic phagocytosis of circulating blood cells by the reticuloendothelium of the spleen becomes pathologically intensified. This produces some, or all, of the symptoms and findings of agranulocytosis, hemolytic anemia, and thrombocytopenia. Bone marrow elements are normal, except for hyperplasia. The spleen is enlarged, and splenectomy is effective therapy.

Sickle Cell Anemia

This is a hereditary anomaly of the erythrocytes, limited essentially to persons of Negro ancestry. The red cells take on a sickle shape when the oxygen tension is reduced. The sickle cell trait is found in about 7.3 per cent of negroes, but only about one out of forty with the trait develops anemia. The anemia is hemolytic, and there are nucleated red cells, polychromasia, stippling, and increased number of reticulocytes in the peripheral blood. There is leukocytosis and an increase in thrombocytes. Red cells may show increased resistance to hypotonic salt solution. Rouleaux formation is prevented due to the shape of the red cells, so that the sedimentation rate is low.

Thrombocytopenic Purpura

This disease is characterized by interstitial hemorrhages in the skin and mucous membranes. There may be gross bleeding from the mucous membranes, uterus, gastrointestinal tract, etc. The thrombocyte count is low due either to deficient production by the bone marrow, excessive destruction of thrombocytes by the spleen or excessive utilization of thrombocytes in preventing leakage from damaged capillaries. The bleeding time is prolonged, clot retraction is poor, capillary fragility increased, coagulation time normal, and thrombocyte count is usually under 60,000 if purpura is present. Anemia is proportional to the hemorrhage. Neutrophilia may also be present due to hemorrhage. Bone marrow aspiration usually shows a normal number and morphologic appearance of the megakaryocytes in the idiopathic type. In the secondary type the megakaryocytes may show changes from the effects of the toxins, chemicals, drugs, etc. The toxic changes include lack of normal granules, vacuolization or hyalinization of the cytoplasm and small, round pyknotic nuclei.

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Human Genetics

WHO Chronicle 18(3): 105, March 1964.

The rapid and profound changes that are taking place in human societies and in man's environment make it imperative to know more about the genetic structure of human populations and about changes that may be occurring in this structure. Because of the need for studies of this kind, a training course in field and laboratory methods of human population genetics was held in Bombay from 18 November to 14 December 1963, as part of WHO's expanding program in this field. The course, which brought together 20 medical and scientific workers from India, Indonesia, Iran, Pakistan, and Thailand, dealt with recent advances in simple laboratory and field techniques that may be used as diagnostic aids in pathology departments, medical and pediatric clinics, etc. and as research tools in human genetics and anthropology.

MISCELLANY

Space and Astronautics Orientation Course

This course has been established to give senior officers of the Navy a better understanding of this new technology, its application to naval warfare, and its important role in national defense. The course is in consonance with the Navy's global mission and emphasizes the significant impact of astronautics on seapower. It is primarily designed for those senior officers who have not had the opportunity to gain knowledge of astronautics and current Space programs. A highlight of the course is a visit to the space vehicle launch and control facilities at Point Arguello Naval Missile Facility and at Vandenberg Air Force Base.

Location:	U. S. Naval Missile Center, Point Mugu, Calif.
Duration of Course:	Four days (Tuesday - Friday)
Convening dates of Course:	7 July 1964 — 27 October 1964
	21 July 1964 — 17 November 1964
	18 August 1964 — 1 December 1964
	25 August 1964 — 15 December 1964
BUMED Quota:	One for each class
Deadline Date to Apply:	Immediately for the 7 July and 21 July courses, and six weeks in advance for the remaining courses
Eligibility:	Rank of Commander and above. TOP SECRET Security Clearance required.

In view of the shortage of travel funds for Fiscal Year 1965, only a limited number of officers can be authorized to attend these courses on travel and per diem orders chargeable against Bureau of Medicine and Surgery funds. Eligible and interested officers who cannot be provided with travel orders to attend at Navy expense may be issued Authorization Orders by their Commanding Officers following confirmation by this Bureau that space is available in each case. Requests should be forwarded in accordance with BUMED INSTRUCTION 1520.8 and comply with the deadline dates indicated above. All requests must indicate that a security clearance of TOP SECRET has been granted to the officer requesting attendance, and if Bachelor Officer's Quarters are desired.

—Training Branch, Professional Division, BuMed.

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Postgraduate Short Courses for Medical Department Officers Sponsored by the Department of the Army during FY 1965

The following postgraduate professional short courses will be conducted by the Army Medical Service during Fiscal Year 1965. Officers desiring to attend should submit their requests in ample time to reach the Bureau at least 8 weeks prior to the convening date of the course desired. This lead time is necessary in order to comply with the Army's request to return unused quotas 6 weeks in advance of the convening dates of the courses listed.

COURSES	INSTALLATION	DATE
Ophthalmic Pathology	Armed Forces Institute of Pathology	14-18 Sep 1964 MC
Orthopaedic Pathology	Armed Forces Institute of Pathology	28 Sep- 6 Nov 1964 MC
Forensic Dentistry	Armed Forces Institute of Pathology	26-30 Oct 1964 DC, MC
Introduction to Research Methods	Armed Forces Institute of Pathology	2-6 Nov 1964 DC, MC, MSC
Forensic Pathology	Armed Forces Institute of Pathology	11-15 Jan 1965 MC, MSC
Application of Histochemistry to Pathology	Armed Forces Institute of Pathology	18-22 Jan 1965 DC, MC, MSC
Kimbrough Urological Seminar	Brooke General Hospital	2-5 Nov 1964 MC
17th Annual Symposium on Pulmonary Diseases	Fitzsimons General Hospital	21-25 Sep 1964 MC
Prosthodontics	Letterman General Hospital	26-30 Oct 1964 DC
Present Concepts in Internal Medicine	Letterman General Hospital	3-6 Nov 1964 MC
Restorative Dentistry	Letterman General Hospital	7-11 Dec 1964 DC

COURSES	INSTALLATION	DATE
Armed Forces Examining Station Examiners Course	Medical Field Service School, Brooke Army Medical Center	3-7 Aug 1964 14-18 Sep 1964 19-23 Oct 1964 8-12 Feb 1965 MC
Fundamentals of Medical Support in Modern Warfare	Medical Field Service School, Brooke Army Medical Center	26 Oct-6 Nov 1964 All Corps
Trends in Dental Laboratory Activities	U. S. Army Institute Dental Research, Walter Reed Army Medical Center	26-30 Oct 1964 DC
Preventive Dentistry	U. S. Army Institute of Dental Research, Walter Reed Army Medical Center	16-20 Nov 1964 MSC, NC MC, DC
Prosthodontics	U. S. Army Institute of Dental Research, Walter Reed Army Medical Center	7-11 Dec 1964 DC
Oral Surgery	U. S. Army Institute of Dental Research, Walter Reed Army Medical Center	11-15 Jan 1965 DC
Medical Aspects of Recovery from Thermo-nuclear Attack (Med Mgmt of Mass Casualties)	Walter Reed Army Institute of Research	15-17 Sep 1964 All Corps
Current Trends in Medical Laboratory Activities	Walter Reed Army Institute of Research	2-6 Nov 1964 MC, MSC
Current Trends in Army Social Work	Walter Reed Army Institute of Research	11-15 Jan 1965 MSC
Medical Nursing	Walter Reed Army Institute of Research	25-29 Jan 1965 NC

This is only a partial listing of the postgraduate courses offered by the Army. The other courses will be announced in the U. S. Navy Medical News Letter in the near future. —From Professional Division, BuMed.

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Oak Knoll's Exhibit on Sex Education Presented at A. C. O. G. Meeting in Miami

"Sex Education is a Professional Responsibility" is the title of an exhibit CAPT James P. Semmens, Chief of OB-GYN of the U. S. Naval Hospital, Oakland, and members of his staff prepared for the meeting of the American College of Obstetricians and Gynecologists which was held in Miami from 17-22 May.

CAPT Semmens is chairman of the Sex Education Committee—a part of the Committee on Maternal Health of the college.

The exhibit is a series of panels showing materials available for instruction at six different levels—elementary school, junior high, high school, college, medical school, and residency training. The materials include books, movies, and magazine articles available for teaching at all levels. At the top of each panel is a color transparency showing students engaged in discussion and study at the different levels.

CAPT Semmens, LT Robert C. Cefalo, third-year-OB-GYN resident, and LT Armand J. Choquette, Jr., second-year resident, monitored the exhibit at Miami. They also presented a one-hour movie program, showing the three best movies from 60 the committee had reviewed in connection with its studies. A brochure containing the information included in the exhibit was published for distribution at Miami and at various locations where the College arranged to present the display following the Miami meeting.

Assisting the doctors in preparing the exhibit were HMCM C.C. Coward, administrative assistant to CAPT Semmens, HM1 E. E. Montgomery of the Navy Prosthetic Research Laboratory, HM2 Manuel Villaroman of Photo Lab, and HM3 Clarence W. Shawver III of the Outpatient Department.

—Submitted by RADM C. L. Andrews MC USN, Commanding Officer, USNH, Oakland, Calif.

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From the Note Book

AMA Motion Picture Catalog Now Available. (Chicago). The most complete catalog ever compiled of medical and surgical motion pictures has been published by the American Medical Association.

The new book, Medical and Surgical Motion Pictures, lists over 3,000 available motion pictures dealing with every phase of the healing arts. Up-to-the-minute listings were made possible through computer processing.

The new catalog will be an invaluable tool in the training of students, nurses, and graduate physicians. This catalog is aimed at the potential user of films of a professional nature and includes films for personnel in ancillary fields of medicine.

The film listings are divided in three general categories: basic sciences, clinical medicine and surgery, and para-medical sciences. It is then

subdivided into some 600 specialty subjects. The films are listed alphabetically under each specialty.

Included with the listing is a brief summary, running time, black and white or color, silent, optical or magnetic sound, year of release, language versions other than English, names of the authors and producers, and the name and the address of the primary rental source. Films have been chosen which are readily available in the United States. In many cases a critical evaluation of the motion picture is included with its listing. Present plans call for the catalog to be updated periodically.

The Medical and Surgical Motion Pictures catalog is available at the cost price of $5.00 to addresses in the U.S., U.S. Possessions, and Canada; $5.50 to other foreign addresses. Write to the American Medical Association, 535 North Dearborn Street, Chicago, Illinois 60610.

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Skin Divers Take Note! Sport divers can get some valuable tips from the U.S. Navy Diving Manual that will make pursuit of their sport more safe and secure. Recently revised, the manual presents information on the general principles of diving.

It covers such subjects as underwater physics and physiology; basic diving procedure; decompression tables; hazards (including a general description of appearance, behavior, and localities where hazardous marine life is most likely to be found); and general safety precautions (first aid instructions, mouth-to-mouth resuscitation, and several methods of artificial respiration).

There is also timely information about:

Surface-supplied diving:

- Standard diving equipment
- Air Supply
- Communications
- Boats and floats
- Diving procedures

Self-contained diving:

- Techniques (personal and buddy system)
- Equipment
- Open, closed, and semi-closed circuit scuba
- Emergency procedures

Copies of the manual may be purchased on order from the Superintendant of Documents, Government Printing Office, Washington, D.C. 20402. Cost per copy is $3.25 postpaid (anywhere in the U.S., Fleet Post Office included), by check or money-order.

Those interested in diving are encouraged to familiarize themselves with the contents of this manual. Compliance with the safety measures set forth in the manual can prevent a tragic diving accident.

—From NAVNEWS, Dept of the Navy, Office of Information Internal Relations Div, Washington, D.C., 1 May 1964.

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Naval Medical Research Reports

U. S. Naval Dental School, NNMC, Bethesda, Md.

1. Chemical and Visual Changes in Tooth Enamel Caused by Lactic Acid and Hydrofluoric Acid: MR 005. 12-5002. 01. 03, March-April 1964.

U. S. Naval Medical Research Institute, NNMC, Bethesda, Md.

1. Dry Weight and Nitrogen Content of Schistosoma Mansoni from Experimental Infections: MR 005. 09-1031. 01 Report No. 13.
2. Penetration of Mouse and Rat Skin by Schistosoma Mansoni Cercariae: MR 005. 09-1031. 01 Report No. 14.
3. Some Effects of Vibration on Totally Immersed Cats: MR 005. 14-3001. 03 Report No. 11, November 1963.
4. Cultivation of the Exoerythrocytic Stages of Malarial Parasites: MR 005 .09-1030. 02 Report No. 9, January 1964.
5. The Use of Silicone Rubber as a Carrier for Prolonged Drug Therapy: MR 005. 0020. 01 Report No. 2, March 1964.
6. Neuromuscular and Cytotoxic Effects of Holothurin A and Related Saponins at Low Concentration Levels. III. : MR 005. 06-0010. 01 Report No. 31, March 1964.
7. The Relationship of Wolbachia Persica Suitor and Weiss to Its Host: MR 005. 09-1200. 02 Report No. 12, March 1964.
8. Fluorometric Demonstration of Tryptophan in Dentin and Bone Protein: MR 005. 12-5000. 02 Report No. 16, March-April 1964.

U. S. Naval Medical Field Research Laboratory, Camp Lejeune, N. C.

1. User Test of Daylight Processing Tank Unit for Dental X-Ray Film: MR 005. 12-6001. 6, March 1964.
2. A Serum Protein Electrophoretic Abnormality Following Experimental Burn Trauma: MR 005. 12-7020 Subtask 1 Report No. 7, April 1964.
3. Correlation of Selected Laboratory Tests of Physical Fitness with Military Endurance: MR 005. 01-0030, April 1964.
4. Rhinovirus Neutralizing Antibody Responses and Their Measurement: MR 005. 09-1204 Subtask 4 Report No. 12, April 1964.
5. Relationship of Rhinovirus Infection to Mild Upper Respiratory Disease: MR 005. 09-1204 Subtask 4 Report No. 13, April 1964.

U. S. Naval Air Development Center, Aviation Medical Acceleration Laboratory, Johnsville, Penna.

1. Electroencephalographic Changes in Human Subjects During Blackout Produced by Positive Acceleration: MR 005. 13-0002. 2 Report No. 12, April 1964.

U. S. Naval Hospital, Navy Prosthetic Research Laboratory, Oakland 14, Calif.

1. Clinical Aspects of a Serologic Study of Psychoses: MR 005. 12-1408, March 1964.

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DENTAL SECTION

The Prevention and Treatment of Periodontal Disease

By John W. Knutson D D S, Dr. P. H. Southern California State Dental Assn. Journal 32(4): 140-146, April 1964.

Periodontal disease and dental caries are running a close race for first place as a major cause of tooth loss. Not only is the race remarkably equal, but it is characterized by being a shared one with dental caries taking its toll during the first three decades of life, and periodontal disease taking over from there. When dentists examine the means available to them for preventing and controlling these two diseases, they find solid evidence that fluoridation of drinking water and other uses of fluorides make it possible for dentists to bring about a major reduction in the incidence of dental caries. An analysis of the methods available for preventing and controlling periodontal disease leads to the conclusion that there are more effective methods available for preventing periodontal disease than for preventing and controlling dental caries. The gaps are not so much in the knowledge as in the application of the available methods.

Among the clinical observations on periodontal disease, the most consistent is the direct and highly correlated association between the prevalence and severity of the disease and the prevalence of calculus and oral debris.

Data gathered in epidemiological studies show that nutritional inadequacies or deficiencies vary widely among different population groups, and the prevalence of periodontal disease varies widely also. Nevertheless, internal analysis of the data and multiple comparisons reveal no consistent relationship between nutritional inadequacy or deficiency and the prevalence or severity of periodontal disease. Further study of the data leads to the conclusion that most of the variants in periodontal disease scores were associated with faulty oral hygiene and age.

Occlusal stress, malocclusion or traumatic occlusion has, and is continuing to receive, important emphasis, both in the prevention and treatment of periodontal disease. Rather limited laboratory work on animals has tended to demonstrate that traumatic occlusion does increase mobility of the teeth, but does not concomitantly produce alveolar bone destruction and pocket formation. Another clinical observation found that periodontal disease was more prevalent, and slightly more severe, in teeth with open carious lesions than in teeth free of signs of caries, and that teeth with one or more filled surfaces were in better periodontal condition than either. It was suggested, however,

that filled teeth are more apt to be found in the mouth of the person receiving adequate dental care and unfilled carious lesions in the mouth of the person who neglects both professional care and personal hygiene.

Thus, it seems clear that the results of studies in population groups point consistently to a marked association between the prevalence and severity of periodontal disease and oral hygiene status. Malnutrition, traumatic occlusion, food impactions, mouth breathing, use of tobacco, and defective dental restorations may serve as aggravating factors, but none of them are dominant or of major significance in the causative role.

Inasmuch as the periodontal disease is a very prevalent condition with a tendency to endanger the dental health of nine out of every ten persons, it is essential that the general dental practitioner incorporate specific oral hygiene instructions and surveillance in his everyday practice. It is he who will determine whether or not his patients are successful in preventing periodontal disease. It is he who must determine whether or not referral to a specialist in periodontal disease is to be made; and before doing so, the patient should be prepared by instructions, guidance, and checking of his oral hygiene practices. If the patient is not willing to cooperate in a program of effective oral cleansing, it is doubtful that he should be advised to have periodontal surgery since postponing the edentulous state in cases where it is inevitable will contribute to progressive loss of alveolar bone and complicate and make more difficult the preparation and wearing of artificial dentures.

Oral hygiene is a highly effective preventive method for bringing about a ninety percent reduction in the incidence of periodontal disease. Emphasis must be placed on the efficiency of cleansing and on success in removing and preventing the accumulation of accretions and debris on the teeth and gingivae, rather than on the frequency of toothbrushing. Home cleansing must be supplemented by dental prophylaxis at six-month intervals, or more frequently, if necessary, and by checking the efficiency of home cleansing procedures. Dental practitioners must promote the widespread application of oral hygiene for the prevention of periodontal disease, and proper uses of fluorides for the prevention of dental caries in order to have a program which is truly designed to insure lifetime teeth.

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Crazing of Acrylic Fillings in Relation to Various Inserting, Finishing, and Polishing Techniques

Takao Fusayama, Masaomi Inoue, Tadahiko Hirano, and Hiroyasu Hosoda. Tokyo Medical and Dental University, Tokyo, Japan. J D Res 43(2): 187-192, March-April 1964.

Owing to recent improvements in cavity preparation and other details of the inserting technique, the clinical results of acrylic fillings at the Tokyo Medical

and Dental University Dental Hospital have been reported to be much superior to those of silicate cement fillings. Acrylic fillings can now be used to correct incisal defects, wedge-shaped defects, and cervical decays. This is because of their higher tensile, bending, and edge strengths and the non-pressure technique. Reinforcement with a wire skeleton can be readily used in extensive cavities.

Acrylic fillings still have some disadvantages. One of them is discoloration. It was felt that the frequency and degree of discoloration could be greatly reduced by use of such proper techniques as sufficient monomer liquid during brushing-on insertion, immediate covering with tinfoils after insertion, adequate polishing, and sanitary care of the mouth.

The first suspected cause for discoloration was the chemical change of tertiary amine used as the accelerator, but this factor has been minimized in modern materials. Discoloration can, however, occur even in a material without amine. Fusayama, Iwamoto, Kurosu, Watanabe, and Inaba have found that most cases of discoloration occurred in unclean mouths or unclean portions of mouths. They concluded that the most significant factor was contamination.

Such contamination was considered to be more severe on surfaces having crazing (microscopic cracks). Sweeney, Yost, and Fee, and Skinner and Phillips have reported that crazing was produced on heat-cured acrylic resin by treating it with alcohol or acrylic monomer. Korber and Meyer have reported that organic solvents produced crazing on the surfaces of heat-cured acrylic plates that had been crudely polished. Such a crazing was considered to be produced by releasing the original, internal molecular stress.

A self-curing, acrylic resin was filled in glass-tube cavities by various inserting, finishing, and polishing techniques. Crazed surfaces of the fillings produced by ethyl alcohol of various concentrations, were stained with iodine potassium iodide, sectioned and observed microscopically. The unfinished surfaces of the fillings made by the pressure technique showed severe crazing with alcohol stronger than 40%. The tinfoil cover produced crazing on the specimens made by the brush-on technique, when treated with alcohol stronger than 60%. The depth of the cracks was less than 50 u. No significant difference was found between dry and wet finishings. Dry polishing with a rubber cup lubricated with insufficient paste roughened the surface but did not increase crazing.

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Linear Stability of Polysulfide and Silicone Impression Materials*

When correctly used, both polysulfide and silicone impression materials will meet clinical requirements. With lapse of time, the polysulfides are more stable than the silicones.

With both materials, for impressions taken with testing equipment at 95° F. and allowed to set at that temperature, the resulting casts are more accurate than those made at room temperature.

With the polysulfides, casts are more accurate if the impressions are poured within 30 to 60 minutes from the time the impression is taken. For greatest accuracy, impressions made of silicone-base materials should be run within 30 minutes of the time in which the impression is taken. Silicone impression materials should not stand overnight before the impression is poured.

Polysulfides tested three years ago were more accurate than those tested recently. Physical properties of dental impression materials tend to change from batch to batch of a given manufacturer and from brand name to brand name. Dental manufacturers probably are seldom to blame for such changes in their products. The basic materials furnished by the suppliers are usually responsible for the somewhat erratic behavior of some impression materials, particularly the polysulfides. (George M. Hollenback, J S Calif D A 31: 369-372, November 1963. From Dental Abstracts 9(2): 98, February 1964).

Personnel and Professional Notes

Great Lakes Dentist to Serve on IADR Special Committee. The President of the International Association for Dental Research has appointed CAPT William E. Ludwick DC USN, to serve on the Ad-Interim Committee of the IADR for 1964-65. The purpose of the Committee is to explore the feasibility of having the American Dental Association serve as the publisher of the Journal of Dental Research. CAPT Ludwick is attached to the Dental Research Facility, Administrative Command, USNTC, Great Lakes, Ill.

Joint Meeting of Navy and Civilian Dentists in Florida. CAPT John H. McEachren DC USN, Dental Officer, NAS, Jacksonville, Florida, and Navy Dental Officers of the Northeast Florida area hosted members of the Jacksonville Dental Society at the Naval Air Station, Jacksonville, on 18 March 1964. Four limited attendance lectures and four table clinics were offered to the 138 dentists who attended the meeting.

Limited Attendance Lectures

Advanced Concepts of Operative Dentistry. CAPT J. F. Pennington DC USN NAS, Cecil Field, Fla.

Temporomandibular Joint Derangement. CAPT J. C. Stoopack DC USN USNH, Jacksonville, Fla.

Table Clinics

Tooth Alteration for Partial Dentures LCDR J. B. Holmes DC USN, Naval Station, Mayport, Fla.

One Sitting Root Canal Filling with Apicoectomy. LCDR A. J. Landry DC USN, NAATC, Jacksonville, Fla.

Limited Attendance Lectures

Base Stability for the Lower Distal Extension Partial Denture; Consideration and Technique. CAPT Davis Henderson DC USN, NAS, Jacksonville Fla.

Some Occlusal Problems in the Treatment of Periodontal Conditions. CAPT Henry Collett DC USN (Ret), Jacksonville, Fla.

Table Clinics

An Added Esthetic Consideration Through Bleaching of Pulpless Teeth. LT J. E. Vaught DC USNR, NAS, Cecil Field, Fla.

The Principles of Fabrication of Complete Coverage Veneer Crowns. CAPT S. E. W. Spann DC USN, NAS, Jacksonville, Fla.

NDS Dental Officer Presentations. CAPT Gordon H. Rovelstad DC USN, recently presented a lecture entitled, Current Concepts of Preventive Dentistry, before the Fifteenth Annual Combined Scientific Meeting of the Philadelphia County Dental Society at the USNH, Philadelphia, Penn.

CAPT John E. Flocken DC USN, presented an essay entitled, Utilization and Restoration of Pulpless Teeth as Abutments for Fixed Prostheses, before the American Association of Endodontists on 16 April 1964 in Washington, D. C.

LCDR James D. Enoch DC USN, presented a lecture entitled, Porcelain Inlays, before the Howard University College of Dentistry on 16 April 1964 in Washington, D. C.

Joint Navy-Air Force Meeting Held at Portsmouth, N. H. The U. S. Naval Shipyard, Portsmouth, New Hampshire, hosted a joint meeting of Navy and Air Force dental officers in the Portsmouth area on 6 March 1964. CAPT Robert E. Blair DC USN, the Shipyard Dental Officer, and LT COL Harry Shore DC USAF, of Pease AFB, made arrangements for the meeting. CDR Robert W. Bagby DC USN, Chief of Dental Service at the Naval Hospital, Portsmouth, presented an interesting clinic entitled, Surgical Procedures.

Reenlistment Statistics for Dental Technicians. The following reenlistment statistics for the first half of fiscal year 1964 were recently released by BUPERS. A comparison of the last figures released, U. S. Navy Medical News Letter 42(10): 26, reveals first term reenlistments have increased.

DT First Term	24.4%
DT Career (over 4 years)	83.3%
DT Reenlistment Rate for FY 64 to date	39.4%
DT Reenlistment Rate for January 1964	36.8%
Overall Navy Reenlistment Rate FY 64	39.0%

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OCCUPATIONAL MEDICINE

Problems in Recognition of Lead Intoxication

Mitchell R. Zavon MD, Cincinnati. Archives of Environmental Health 8(2): 74-77, February 1964.

Previous speakers have alluded to some disease entities which must be considered in the differential diagnosis of plumbism but these are the more likely suspects which have been mentioned. There are other diseases that have been or may be mistaken for lead intoxication. The list is legion. In some instances other disease entities are mistaken for lead intoxication because of a failure to appreciate the nature of plumbism. In some cases, the error may be due to an unwillingness or an inability to think in a logical manner.

Without lead there can be no lead intoxication—a reverse way of saying there must be a source of lead. But given a source of lead, the illness of which the patient complains is not necessarily lead poisoning.

Too much stress cannot be placed on this last point. For the doctor to diagnose lead poisoning, the patient must have had a history of exposure to lead; but, contrariwise, the history of exposure to lead does not automatically mean that all associated illness is lead poisoning. What are the disease entities that may be mistaken for lead poisoning? Obviously, many diseases have been diagnosed as lead intoxication that do not resemble plumbism even faintly, but this is not the place to catalog lists of faulty diagnoses. Rather, assemble the possibilities in a reasonable order and assemble them into groups which can be studied in a systematic manner.

Syndromes of Lead Intoxication. Lead intoxication resulting from excessive absorption of inorganic lead may result in one of three fairly distinct disease entities or combinations of these entities. These are: (a) the abdominal syndrome; (b) the neuromuscular syndrome; (c) a central neurological syndrome (encephalopathy).

Lead intoxication resulting from excessive absorption of an organic lead compound may lead to a neurological syndrome distinct from that due to intoxication from excessive absorption of an inorganic lead compound. The diagnosis of organic lead intoxication has been discussed previously, but the differential diagnosis will be reviewed later in this article.

In order to sift out those syndromes which are not lead poisoning from those which are, the characteristics of lead poisoning must be known. Unfortunately, the syndrome of lead poisoning is not widely known. It is perhaps more widely "recognized" than it is known.

Abdominal Syndrome

Colicky pain is frequently the presenting complaint in lead poisoning. It may be accompanied by headache and often by generalized muscular discomfort. Anorexia is common and leads to loss of weight. Some or all of these symptoms may occur in a number of the other diseases in the following list: (a) acute appendicitis; (b) renal colic; (c) duodenal ulcer; (d) gastric ulcer; (e) acute gastroenteritis; (f) acute porphyria; (g) heat exhaustion; (h) parasitic infestation, intestinal; and must be distinguished from lead intoxication. The differential diagnosis is made difficult by the similarity in symptoms, particularly during the early stages, of many of the diseases listed. It is further complicated by the length of time required to get analysis of the lead content of the blood. Then, too, the presence of an increased concentration of lead in the blood does not protect a person from any of the diseases listed or from a host of others.

The pain of renal colic begins in the flank and radiates toward the inner surface of the thigh or the genitalia, whereas the pain of lead colic or acute porphyria is usually more generalized in its distribution. Acute appendicitis is notoriously deceptive, but the physical signs become more localized than those of lead colic while accompanied by a white blood cell count that is apt to be, but is not always, much higher than that found in plumbism. Acute gastroenteritis resembles the pain of lead colic but is more frequently accompanied by diarrhea than is the latter.

Descriptions of the diseases which may resemble the abdominal syndrome of plumbism can be long and detailed, but when one is faced with the individual case he must, as a rule, base the diagnosis on the occupational history, the progress of the symptoms, and such results as can be furnished by the clinical laboratory in a short period of time. Many persons with lead intoxication have been operated upon mistakenly for acute appendicitis and occasionally for other surgical conditions. The difficulty of making the diagnosis of acute lead intoxication may be very real when the patient presents abdominal symptoms and a vague or unclear occupational history.

In addition to the diseases already mentioned, a number of chemicals may induce symptoms not unlike those of lead intoxication. The chlorinated hydrocarbon insecticides, for example, may cause anorexia, nausea, and vomiting, with or without abdominal pain. Other types of intoxication should not be forgotten when exploring the possible causes of these symptoms. The ashen pallor and weakness which frequently accompany the colicky abdominal pain are common to many debilitating diseases and are not characteristic in themselves.

Muscular Syndrome

Muscular weakness and palsy occur only after prolonged and grossly excessive absorption of lead accompanied by muscular activity. This type of paralysis is usually most prominent in the most active groups of muscles and then usually in the extensor group. It has not been commonly found in the United States in recent years.

Rarely the extraocular muscles of the eye have been affected, and occasionally the extensor muscles of the lower leg or foot have been involved though the most commonly shown picture is that of the worker with wrist drop. The paralysis is not usually accompanied by sensory changes, nor is it associated with pain.

Any form of peripheral neuritis in a person with a history of significant exposure to lead must be distinguished from intoxication caused by: (a) infection; (b) malnutrition; (c) metabolic disease (diabetes); (d) arsenic. The many systemic neurological disorders must also be differentiated from the hysterical type of paralysis, as well as from lead intoxication.

Lead palsy is often unilateral, occasionally bilateral, and only rarely does it affect more than one or two extensor muscle groups. A localized infection of a nerve or the old "Saturday night paralysis" of radial nerve palsy may mimic wrist drop from lead absorption. While lead palsy is a motor impairment affecting primarily the extensor muscles, arsenical polyneuropathy is usually sensory, but even when motor involvement is present there will invariably be sensory impairment. Diphtheritic neuropathy is usually more diffuse than palatal, ocular, and phrenic lead palsy, affecting phrenic as well as peripheral nerves. The diagnosis may be difficult if nasal or cutaneous diphtheria has been undiagnosed.

The course and duration of illness will help to differentiate lead palsy from other neuropathies. Weakness may exist for a prolonged period of time before paralysis in lead palsy, whereas the paralysis due to arsenic is usually not so delayed. Localized nerve involvement, of infectious or traumatic origin, tends to be more abrupt in onset, though on occasion the course may be equally prolonged.

Diabetic neuropathy is present only in a patient with a diagnosis of diabetes, usually of long standing. Symptoms develop slowly and insidiously and may be asymmetrical. This disease and the many systemic neurological disorders may conceivably be mistaken for lead palsy on occasion, but the history and development of the disease should help make the diagnosis.

Central Neurological Syndrome

Children who have eaten quantities of inorganic lead, and adults and children who have inhaled massive amounts of inorganic lead dust or fumes, are more likely to develop lead encephalopathy. The excitation, confusion, coma, and convulsions of lead encephalopathy are difficult to distinguish from like symptoms of many other causes, such as increased intracranial pressure, unless

the diagnosis is considered. A not inconsiderable number of death certificates signed as aseptic meningitis in children between the ages of two and seven should certainly have borne the label of lead encephalopathy.

Among the disease entities to be differentiated from lead encephalopathy are infections of the meninges or brain, neoplasms, and parasitic infestation such as Echinococcus, hydatid cysts, and schistosomiasis. Tuberculoma, syphilitic infection, and uremia should not be neglected as possibilities. To distinguish these from lead encephalopathy dependence is put on the history, if available. X-ray films of the skull and selected laboratory procedures are of great value.

Organic Lead Intoxication. Thus far in this article, the author has concentrated exclusively on those signs and symptoms associated with inorganic lead intoxication. But much of what has been said applies equally well to organic lead intoxication. Doctors still depend on a history; and the laboratory evidence of lead in the urine, in this case, rather than the blood, is helpful even though laboratory results may be delayed.

Excessive absorption of organic lead results in central nervous system symptoms described as "acute brain syndrome." This is a manic state which can be compared to that of a catatonic schizophrenic and may be impossible to differentiate from the latter without a good occupational history confirmed by a laboratory finding of excessive lead in the urine.

The diseases which must be differentiated from organic lead intoxication include: (a) schizophrenia, catatonic type; (b) amphetamine reaction;(c) acute alcoholic hallucinosis; (d) syphilitic brain disease, euphoric type; (e) monamine oxidase inhibitor taken by a person not in a depressive state.

The history will make the differential diagnosis in most cases, and the syndromes listed are mentioned only as examples of disease states that may be confused with organic lead intoxication.

Specific Problems in Diagnosis.

The "Lead Line"

If he knows nothing else about lead poisoning, the average physician has heard of the "lead line." A blue or blue-black punctate deposit on the gingival margin of the gums frequently constitutes all the evidence he requires to arrive at the diagnosis of lead poisoning. However, there are a number of causes of blue pigmentation of the gingival margins. These may include, in addition to lead: (a) gingivitis (infectious); (b) normal pigmentation in dark-skinned races; (c) bismuth and other metals forming a black sulfide; (d) dental discoloration.

To differentiate a lead line from any of these possibilities, a good history is the first procedure. A glass slide pressed gently against the gum will eliminate the bluish color often associated with gingivitis. Scrapping will remove the discoloration adjacent to a dirty or stained tooth. Normal pigmentation in the buccal mucous membrane is rarely found on the lingual gum, while the most frequent site for the "lead line" is the lingual gum opposite the lower bicuspids and molars.

Without a history of the absorption (therapeutic administration) of metals, it may be impossible to differentiate the deposition of these metals from that of lead without analysis of a biopsy specimen.

Basophilic Stippling

Punctate basophilic stippling of erythrocytes is a normal finding. Eight hundred stipple cells per million erythrocytes is a normal finding and is not an indication of lead intoxication. However, an awareness of the possibility that excessive stippling may be associated with plumbism has lead to many valid diagnoses.

Laboratory Assistance

The accurate quantitative determination of lead in the blood or urine is not a job for an amateur chemist. Unfortunately, diagnoses can be made based exclusively on a history of exposure to lead and a faulty laboratory determination of elevated blood and urinary lead concentration. In no determination is it more important to know the laboratory. If lead analyses are done only rarely they are apt to be done poorly and produce unreliable results.

For many years the chemist has concentrated on developing even more accurate methods of determining the quantity of lead in the blood or urine. The clinician does not need such precision. What is needed is a semi-quantitative method of analysis, sensitive only at the upper limit of the normal concentrations in biological fluids: an analytical procedure which can be reported in four hours or less.

The Radiographic "Lead Line"

An increase in the density of the structure of bone in the areas of rapid growth occurs in association with the absorption of lead, bismuth, or other heavy metals. These areas of increased density occur at the growing ends of the shafts of long bones and along the growing margins of flat bones. As revealed by radiography, these lines can be extremely useful as a warning that the growing child may be absorbing abnormal quantities of lead. Also, other heavy metals and healing rickets must be considered before attributing the lines to lead.

The radiographic "lead line" does not occur in the adult. Skeletal radiographs showing a line similar to that of the "lead line" of the child are due to something other than lead.

In this article, the author has surveyed the scene and attempted to highlight some of the difficulties which might be encountered in the diagnosis of lead intoxication. It should, by now, be obvious that lead intoxication is not a vague clinical entity with all sorts of manifestations. The clinical pattern of the disease tends to vary little from the description in this article. The development

of bizarre illness in a person exposed to lead should not automatically result in the abandonment of all that is known of the proper way to arrive at a medical diagnosis. On the other hand, lead intoxication as a diagnosis should not be missed solely because of the failure to consider it as a possibility.

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Perchlorethylene and 1, 1, 1-Trichloroethane Inhalation

National Clearinghouse for Poison Control Centers, USDHEW, PHS, Washington, D. C., March-April 1964.

The National Clearinghouse recently received a report described as a suicide attempt with perchlorethylene and 1, 1, 1-trichloroethane. These ingredients were part of an instant shoe coloring product which carried a caution label against internal consumption, excessive inhalation and access to the reach of children.

The patient is alleged to have repeatedly inhaled the vapors of this product in the evening until unconsciousness ensued. The following morning, inhalation was repeated until nausea developed, which was followed by collapse. When first seen by a physician the patient was unconscious and showed labored stridulous respirations, generalized total body tremors with intermittent opisthotonos spasms, stage II depression, absent eyelid reflex (pupil reflex present) and the tongue falling back and obstructing the airway. She subsequently developed "a bizarre type of stertorous respiration in a Cheyne-Stokes pattern." Mouth-to-mouth resuscitation was required three times for prolonged apnea with cyanosis. Deep tendon reflexes were hyperactive, and painful stimuli evoked an opisthotonic response.

Her course in the hospital was uneventful, urine output was 600 to 1800 cc/day, B. U. N. was normal on two occasions, and serum bilirubin was normal on the 4th day. Although there was no paresis of the muscles of mastication there was circumoral numbness over the maxillary division of the trigeminal nerve bilaterally. This gradually cleared over a period of 2 weeks.

Although both of these chemicals are considered to have a moderate narcotic effect, 1, 1, 1-trichloroethane is also a central nervous system irritant and can cause moderate irritation of the mucous membranes, skin, lungs, and cornea. The threshold limits for these substances are 100 ppm for tetrachloroethylene and 500 ppm for 1, 1, 1-trichloroethane, according to the American Conference of Governmental Industrial Hygienists. A recent article in the November-December 1963 issue of the Industrial Hygiene Journal by V. K. Rowe, et. al., reported that these two substances, when combined, produce an additive toxicity depending upon the concentrations of each, but do not produce any potentiation.

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Low Concentrations of CO Shown to Have Immediate Effect on Animals

Industrial Hygiene News Report VII(4), April 1964.

Studies which indicate that low concentrations of carbon monoxide may have an immediate as well as long range detrimental effect on humans were discussed by Professor Dr. Guenther Malorny, Director of the Hamburg University Pharmacological Institute in an interview with Medical Tribune (624 Madison Ave., New York, N. Y.), published in the March 13 issue.

"In the investigations, more than 1000 mice and rats have been tested for motility and reflex reaction. In one series of tests, groups of mice were exposed to CO concentrations of 55 ppm, 84 ppm and 160 ppm for 14 hours, then allowed to walk in a walking drum for 3 hours. The control animals walked 1500 meters; those exposed to 55 ppm, 1000 meters; those exposed to 84 ppm, 750 meters, and those exposed to 160 ppm, less than 500 meters. To relate these exposures to the amounts to which humans may be exposed from automobile exhaust in heavy traffic areas, tests were conducted in the center of Paris during rush hour traffic in which the CO concentration was shown to be approximately 150 ppm."

The escape reaction of animals, conditioned to escape from an electric shock preceded by a light flash and a sound, was also tested. In these tests, animals were exposed to CO concentrations of 140 ppm and 160 ppm every night for 10 weeks (the length of time of the exposure was not mentioned). They were tested six hours after exposure. The first indications of behavioral disturbance appeared after 4 weeks of nightly exposure. After 10 weeks, the conditioned reaction disappeared completely in nearly all the animals. Because the behavioral malfunction remained apparent a long time after exposure to CO stopped, Dr. Malorny and his co-investigators, Drs. Georg Fodor and Heinz Pomp, both of the Institute, expressed the suspicion that permanent damage to the central nervous system had occurred.

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Is There a Killer in Your Medicine Chest?

Utah State Department of Health, Your Health 21(3), March 1964.

This year, according to past experiences as cited by the U. S. Public Health Service, half a million children will swallow potentially poisonous substances —and 500 will die. This needless slaughter can be stopped if parents "poison proof" their houses.

Check your home for these preventives against poisoning your children:

Yes	No	
___	___	Do you keep household products and medicines out of the sight and reach of children? Even if you leave the room for an instant be sure the container is in a safe place.
___	___	Do you store household products only in their original containers? Cups, glasses, and soft drink bottles are for food and beverages—not for bleach, kerosene, turpentine, etc.
___	___	Do you store medicine separately from other household products?
___	___	Are you sure that all your household products and medicines are properly labeled?
___	___	Do you always call medicine by its proper name? Medicine is not candy.
___	___	Do you clean out your medicine chest and storage cabinets regularly?
___	___	Do you use caution when you throw away an old container? The contents should be flushed down the drain and the container rinsed.

Accidental poisonings kill 5 times as many American children under age 5 as poliomyelitis and 2 1/2 times as many as tuberculosis. Most of these deaths could be prevented.

The problem is aggravated by the fact that parents, and even physicians, cannot be expected to know the potential hazards in the thousands of household articles appearing on the market each year. The best we can do is to regard ALL of them with due suspicion as poison in the stomach or as burners of the skin. Keep them where the child cannot reach them and keep ALL medicines locked away. The mere observance of these precautions educates the child to beware of any product in a vial, bottle or can.

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Effects of Hydrazine on Primates Studied

Industrial Hygiene News Report VII(4), April 1964.

A striking difference between the effect of hydrazine and its methylated derivatives on monkeys as opposed to its effect on rats, rabbits and dogs has been indicated in initial studies at Wright-Patterson Air Force Base (Ohio). This

phenomenon was reported by CAPT Roman L. Patrick and Kenneth C. Back of 6570 Aerospace Medical Research Laboratories. Speaking at the Society of Toxicology annual meeting in Williamsburg, Va., March 9-11, CAPT Patrick said that a fatty change takes place with much lower dosages in monkeys than in rats, and moreover, that changes in other tissues such as heart and skeletal muscle occur in monkeys. These results were given:

Ten Rhesus monkeys received daily doses of hydrazine ranging from 5 to 20 mg/kg body weight for a total of 4-20 injections. Serum flutamic oxalacetic transaminase (SGOT), bilirubin, and alkaline phosphatase rose with doses of 20 mg/kg, with more than a 20-fold increase in SGOT in two animals. Cytoplasmic vacuolization appeared in white cells of both blood and bone marrow in some cases. Most of those receiving 20 mg/kg exhibited loss of appetite, vomiting, lethargy, and severe weakness. Postmortem studies revealed lipid accumulation in the liver, myocardium, kidney and skeletal muscle. Massive liver necrosis was observed in one animal. All animals lost weight during the experiment. Seven monkeys received 20 intraperitoneal injections of UDMH (1, 1-Dimethylhydrazine), 10 mg/kg body weight. Blood glucose rose significantly toward the end of the experiment. Lipid was deposited in the liver, heart, and kidney but to a lesser degree than was observed with hydrazine. All animals in the group receiving UDMH also lost weight.

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Occupational Health - Talk or Action

J. Wister Meigs MD, Yale University. American Journal of Public Health, pg 519, March 1964.

Occupational health is just the opposite of the weather. Almost nobody talks about it, except specialists who talk to themselves while everybody does something about it. Not many of this "everybody" know that they are doing something about occupational health, yet practically all employed persons in the United States take part in workmen's compensation medical care programs. Often they demand more, better or different services, thereby shaping the future of occupational health. A small proportion of the working public is involved in more comprehensive, occupationally centered, preventive and health services, and a handful, under special environmental conditions, receive complete medical care as well as preventive services. Thus, some kind of occupational medical or health services seems to be almost universal. Yet this universality coexists with a certain separateness. Each preventively oriented occupational health service continues because someone in management wants it. The "someone" may be in a private industry, a government bureau, a hospital, a health department, a union headquarters, or any organization one may name. This "someone" looks at his budget and decides how much he will devote to medical

and health services, the amount of which is based on the expected needs of the particular organization. This logical train of events has helped generate the myth that an occupational health service is the sole concern of the organization providing it, although it is a general concern.

The lost opportunities for better preventive and public health programs are most glaring in the area of small plant health services. Thirty or forty years ago, Geier, McCord, Selby, and other men of vision pioneered in providing high quality, preventively oriented health services for workers in small plants. Now we find the United States a little further along the road than it was then, while other countries are passing us. Britain has demonstrated a viable pilot model of comprehensive services for small industries in its Slough Industrial Health Service. With joint financing by a private foundation and the industries themselves, and with support from the public health authorities in such areas as rehabilitation, the program has steadily increased the health benefits for persons employed in its area. It now provides health services to workers in many establishments on the so called Trading Estate. The only essential ingredient which this country has lacked is an emotional one. One reaction has been "No giving away of tax money to profit making industries! Let them pay for their own services." The country has lacked emotional commitment to joint private and public efforts, despite their logic. Part of the logic of joint effort relates to cost for successful small plant health programs must be adequately financed. Support must come from outside the struggling, competitive small industries themselves, if occupational health services are to be extended beyond the 2% (a generous estimate) of all establishments now providing preventively oriented occupational health programs. When the necessity for a vigorous partnership of private and public health efforts is accepted, we can begin to progress at speeds commensurate with our capacities.

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Hair Dryer Hazards

Illinois Health Messenger, January 1964.

There is a definite danger of electrocution for women and young girls who wear an electric hair dryer in the bath tub, shower or while standing in a puddle on a laundry floor.

Public health officials warn against these practices. With the advent of the hair dryer that permits the wearer to move about, it is particularly important that members of all women's dormitories and sororities be warned against this lethal practice of bathing or laundering while wearing a dryer. Housewives are also cautioned that a particularly hazardous place to wear a hair dryer is in the laundry room, where water is apt to be spilled on the floor.

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Nutrition in the Americas

From "Facts on Health Problems," Pan American Health Organization (PAHO), Pan American Sanitary Bureau—Regional Office of the World Health Organization, July 1961.

Improvement of the nutritional status of the population of Latin America will increase the productivity of the labor force by increasing working capacity as well as by preventing illness and death in the population. Several Ministries, such as Agriculture for food production, Highways for food transportation, Health for incorporation of the nutrition program in basic health services, and Education for teaching of food values, contribute to the success of the nutrition program.

Work capacity depends on food intake. The daily provision of three well-balanced meals to local laborers working on the construction of the Pan American Highway increased the weight of the men by 10 to 15 pounds and daily work production in cubic yards of concrete paving per man from 1.8 to 5.9. [1]

Nutritional deficiencies result from three major factors:

1. Shortage of production of essential foods.
2. Lack of purchasing power.
3. Lack of understanding of the value of certain foods.

In ten Latin American countries with data available, per capita consumption ranged from 1960 to 3100 calories daily. Available animal protein is less than 10 grams per person per day in some areas. Often cereals provide up to 78% of the total protein. The low comsumption of protein of good quality results in specific deficiency diseases, lack of resistance to infection, and poor physical development.

To pay for a kilogram of meat (boneless brisket) takes 4.5 hours of work of a skilled laborer in Colombia and El Salvador, and 3.5 hours in Mexico. Only in Argentina, of the 10 countries for which data were available, was this work time less than 1 hour. A liter of milk can be purchased from wages for 52 minutes of work in El Salvador and approximately 30 minutes in 7 of the countries with available data.

In addition to the factors already mentioned and to local customs, lack of transportation and refrigeration, one of the major factors responsible for nutritional deficiencies is the lack of understanding of the values of certain foods, especially proteins. Measurement of the extent of malnutrition is difficult. That the situation is serious is indicated by excessive mortality from nutritional deficiency states and anemias in Latin America.

The problem that stands out is protein malnutrition, which occurs frequently in children in the weaning and post-weaning periods in Central America, Mexico, and in many parts of South America. Corn is the principal crop but provides protein of poor quality.

In many areas of Latin America, between 3 and 6% of the children have severe forms of protein malnutrition and between 6 and 50% moderate states of deficiency. The remaining 50% do not have an optimum level of nutrition. Malnutrition lowers resistance to infections and respiratory diseases and thus also contributes to excessive mortality in children under 5 years of age.

The prevention of nutritional deficiency involves changes in traditional food habits and cooperative efforts of health, agricultural, economic and fishery departments. Ways of feeding children sufficient protein without using costly foods such as milk, eggs, etc., are being explored.

The Institute of Nutrition of Central America and Panama (INCAP) has developed an inexpensive vegtable mixture (Incaparina) which provides the essential nutrients. Many countries have the necessary products for preparation of protein-rich foods at low cost.

Endemic goiter is a significant health problem in all countries of Latin America with the exception of the Caribbean Islands. It is generally believed that there are at least 30 million persons with endemic goiter in the continent. Goiter is recognized as a problem when rates within a community reach 10%. In many areas of Latin America, the prevalence is well above 50%, even extending to 90%.

Persons with goiter in endemic areas may have lowered mental efficiency which results in a decrease in physical as well as intellectual capacity. Cretinism, deaf-mutism, and feeble-mindedness are frequently reported in association with high prevalence of goiter, but their causal relationship has not yet been confirmed.

Lack of iodine in food and drinking water is the primary cause of endemic goiter. Use of iodine in salt has been successful in remedying iodine deficiency. In Switzerland, where iodized salt was introduced more than 30 years ago, endemic goiter has largely disappeared. The importance of salt iodization as a preventive measure is widely recognized. Although legislation has been passed in nine Latin American countries, only in two countries, Paraguay and Guatemala, and partially in Colombia, are there effective programs of salt iodization.

In addition to production and distribution of adequate food supplies, experience shows the value of education of the population in regard to correct diets. Lack of qualified personnel is one of the limiting factors in the promotion of nutrition in Latin America.

A nutrition program includes adequate training of directors and chiefs of departments of nutrition, health workers, nutritionists and dieticians, teachers in primary and secondary schools, agricultural and extension workers and other related workers.

Reference

1. Winslow, C. E. A., The Cost of Sickness and the Price of Health, WHO, Geneva, 1951.

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RESERVE SECTION

Naval Reserve Medical Service Corps Officers Recommended for Promotion to the Grade of Commander by the Selection Board Convened on 3 March 1964.

190257	Aurand, Leonard W.	255035	Krause, James B.
348421	Bongberg, Jack W.	220929W	Molnar, Dorothy M.
412431	Duff, James T.	371358	Rubinstein, Eli A.
228599	Funk, Lee W. Jr.	404464	Smith, Pierre F.
335577	Heath, James P.	379357W	Stoll, Alice M.

Nurse Corps Officers of the Naval Reserve Recommended for Promotion to the Grade of Commander by the Selection Board Convened on 3 March 1964.

248389W	Pierce, Gloria L.	396116W	Squier, Sara E.

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American Optometric Association

The Annual Congress of the American Optometric Association will be held in New York City at the New York Hilton Hotel during the period 28 June-2 July 1964. A Military Symposium in conjunction with the meeting will be held on 28 and 29 June and 1 and 2 July 1964. Each session will be at least two hours in duration.

By authority of the Chief of Naval Personnel, one retirement point may be credited to eligible Naval Reserve Medical Service Corps (Optometry) officers in attendance. Officers are requested to register with the Commandant's Representative in order that attendance may be recorded and reported.

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Active Duty for Training During FY 1965

The following training courses represent active duty for training authorized for inactive duty Naval Reserve Medical Department officers:

Tissue Bank Training Course

Naval Medical School	6 July 1964	4 Jan 1965
National Naval Medical Center	5 Oct 1964	7 April 1965
Bethesda, Maryland		

Course Description: This course provides orientation in the operation and administration of a Tissue Bank. It includes indoctrination in the methods of tissue procurement; storage, and dispensing; tissue culture; tissue chemistry; processing excised tissue and allied short and long-term research projects in tissue culture and tissue chemistry fields. It also includes indoctrination in the medico-legal aspects of hemotransplantation, the procedure for obtaining permission for tissue donations. Familiarization with the operation of the Tissue bank, registry, and all other administrative practices associated with tissue banking is included.

Eligibility Requirements: Only officers with 2105 designator.

Recognition and Treatment of Diving Casualties

U. S. Naval School, Deep Sea Divers
U. S. Naval Station, Navy Yard Annex, Washington, D. C.
20 July 1964

Course Description: Didactic training in underwater physiology and recognition and treatment of casualties associated with any kind of diving. Instruction includes lectures and demonstrations of the equipment of the School.

Eligibility Requirements: Only male officers with 2105 designator.
